

Paralytic Shellfish Poisoning: The Relationship Between *Alexandrium* Abundance and PSP Toxins on Kodiak Island, Alaska

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Abstract

Paralytic Shellfish Poisoning (PSP) has severe negative impacts in Alaska. This study was designed to improve existing PSP monitoring programs by incorporating phytoplankton monitoring. *Alexandrium* abundance was ascertained at a near shore site on Kodiak Island during 2000 and 2001 using species-specific LSU rRNA targeted oligonucleotide probes in whole cell (WC) and sandwich hybridization (SH) assay formats. *Alexandrium* abundance exhibited two distinct peaks (>400 cells/L) in 2000, both of which lasted approximately 2 weeks. *Alexandrium* abundance in 2001 was much more sporadic, with 4-5 peaks, each lasting only 3-7 days. In 2001, *Alexandrium* abundance tracked water column toxicity as determined via a ³H-Saxitoxin receptor-binding assay. Importantly, DNA probe data revealed a correlation between *Alexandrium* abundance and blue mussel (*Mytilus edulis*) toxicity in both 2000 and 2001. The results also demonstrated that increases in *Alexandrium* abundance preceded elevated toxin levels in shellfish suggesting that this method could prove useful as a monitoring tool to predict toxic events prior to shellfish harvest. Overall, this report provides compelling evidence that DNA probe chemistry can be used to estimate the abundance of *Alexandrium* in the field, however a number of problems must be rectified if the assay is to be used for monitoring purposes.